PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 115709 Son1/sko	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/NO 03/00403	International filing date *(day/month/year)* 02.12.2003	Priority date *(day/month/year)* 04.12.2002
International Patent Classification (IPC) or both national classification and IPC G01S3/808		
Applicant SONITOR TECHNOLOGOIES AS et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 11 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
28.06.2004	08.03.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Reuss, T Telephone No. +49 89 2399-7140

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/NO 03/00403

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-7 as originally filed

Claims, Numbers

1-25 as originally filed

Drawings, Sheets

1-3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

   ☐ the entire international application,

   ☒ claims Nos. 21

   because:

   ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

   ☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 21 are so unclear that no meaningful opinion could be formed *(specify)*:

   see separate sheet

   ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

   ☐ no international search report has been established for the said claims Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

   ☐ the written form has not been furnished or does not comply with the Standard.

   ☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	5,6,8-20,22-25
	No:	Claims	1-4,7
Inventive step (IS)	Yes:	Claims	19,20,22-25
	No:	Claims	1-18
Industrial applicability (IA)	Yes:	Claims	1-20, 22-25
	No:	Claims	

2. Citations and explanations

see separate sheet

Item III

1. **Claim 21** states that stationary master units and slave units each transmit **on their own code 1-n (or l-n ?).** "n" has no antecedent and is therefore unclear. Furthermore, it is not clear whether "1-n" or "l-n" is meant. Finally, it is unclear whether the "-" sign is supposed to mean "to" or "minus". Since the corresponding passage in the description (p. 7, lines 24-25) merely repeats the wording of claim 21, the description cannot serve to solve these objections.
Hence, the additional features of **claim 21** are considered to be so unclear that it is impossible to formulate an opinion with respect to novelty, inventive step and industrial applicability (Rule 66.2(a)(i) in combination with Article 34(4)(a)(ii) PCT).

Item V

2. The following documents (D) are referred to in this report:

D1: US 5 528 232 Verma et al., 18.6.1996 (introduced by the IPEA)
D2: US 6 141 293 Amorai-Moriya et al., 31.10.2000
D3: GB 2 298 098 Vincent et al., 21.8.1996
D4: US 5 245 317 Chidley, 14.9.1993 (introduced by the IPEA)

3. **Claims 2, 5, 8 and 10-19** are considered to lack clarity (Art. 6 PCT):

3.1 **Independent claim 8** claims a system comprising "at least one identification tag according to claims 1-7 for transmitting the identification tag's identification **as well as measured transit time differences** for received ultrasonic pulses". However, only the ID-tag according to claim 4 actually measures a transit time difference that could be transmitted. Therefore, the subject matter of claim 8 is considered to lack clarity.

Moreover, the system according to claim 8 comprises "**at least one stationary master unit**" and "a network interconnecting **master units** with the central processing unit". It is unclear whether the system comprises "at least one" or several master units. (These objections apply **mutatis mutandis to claims 10-18**).

Furthermore, all independent claims should be directed to the essential features of the invention (see PCT Gazette - Section IV - III-3.4). However, the subject matter of independent system claim 8 and independent method claim 19 differ considerably from each other. Therefore, it is not clear for which subject matter protection is sought. It is noted that claim 19 is considered to contain all the essential features of the invention.

3.2 In **independent claim 19** no "transit time differences" are transmitted from the identification tag, but merely arrival times are transmitted (see step f). Hence, the "transit time differences" which are used in step g) do not have an antecedent, thereby rendering the subject matter of claim 19 unclear. However, the description page 7, lines 11-15 defines that **transit time differences are calculated and transmitted.**

As set out in paragraph 3.1, only the ID-tag according to claim 4 measures a transit time difference that could be transmitted. The wording "according to claims 1-7" therefore leads to a lack of clarity.

Furthermore, the method according to claim 19 defines in step d) "receiving the ultrasonic pulses **for** the identification tags according to claims 1-7". It is unclear where and how the pulses for the tags are received. However, it is clear form the description and the drawings, that the pluses are received **at** the identification tags.

Finally, step a) defines **a** central processing unit transmitting a radio message to stationary master units. Step f) defines that the radio signals are transmitted to **a** central processing unit. This leads to a lack of clarity whether there are one or two central processing units used in the method of claim 19. It appears clearly from claims 8-18, the description (e.g. page 6, lines 3-7) and figure 3, that **only one** central processing unit is meant.

3.3 The additional features of **claim 2** claiming that "the frequencies or codes are transmitted from one or more master and slave units which transmit with different frequencies or codes" are **not** technical features defining an identification tag. These are features that define a location system. Hence, the subject matter for which protection is sought becomes unclear.

For the definition of the ID-tag the origin of the frequencies and codes is irrelevant. Hence, these features are not limiting for an ID-tag.

3.4 The "identification tag's calculating unit" in **claim 5** does not have an antecedent which leads to a lack of clarity. It appears that claim 5 should depend on claim 4.

3.5 **Claim 10** defines that the system "comprises one master unit and at least three slave units". It is not specified whether this master unit is stationary as are the master units defined in claim 8. Hence it is unclear whether this is a further master unit (which unit would not be supported by the description) or part of the "at least one stationary master units" of claim 8.
Furthermore, it is noted that "one" is to be read as "at least one". Therefore, if the master unit of claim 10 is one of the stationary master units as defined in claim 8, the repetition of this feature leads to a lack of conciseness (Art. 6 PCT).

4. The subject-matter of **claims 1-4 and 7** is considered to lack novelty, Art. 33 (2) PCT.

4.1 D1 (and D2) disclose both all the features of **claim 1**, as follows:

(a) An identification tag (D1: Fig. 1, 2: 10; Fig. 4 // D2: Fig. 1: 26) for use in a location system for determining the identification tag's location (D1: abstract, lines 1-2; column 5, lines 6-7) in (a) room, in a building or areas to be monitored (D1: Fig. 1: 3 // D2: column 11, lines 56-58),

(b) wherein the identification tag comprises an ultrasonic transducer (D1: Fig. 4: 11 // D2: Fig. 3: 64) connected to a receiver (D1: Fig. 4: 30) adapted to receive ultrasonic signals (D1: column 8, lines 56-58 // D2: column 7, lines 58-60; column 8, lines 49-53),

(c) together with a radio transmitter (D1: Fig. 4: 32 // D2: Fig. 3: 66) connected to an antenna (D1: Fig. 4: 12 // D2: Fig. 3: 61) adapted to transmit radio signals with information (D1: column 7, line 42-43) containing the identity of the identification tag (D1: Table 1: the Tag always returns its Tag-ID and more information if asked for // D2: column 14, lines 43-46; since the acknowledgement signal is

"unique to the particular transmitting unit", it identifies this unit).

4.2 Furthermore, D1 discloses the additional features of **claims 3 and 7** and D2 discloses the additional features of **claims 2-4 and 7**.

See in particular:

- claim 2: D2: column 11, lines 58-61; column 18, lines 62-64; as long as it is not specified what differentiates the master from the slave unit, any "background unit" can be declared master or slave.
- claim 3: D1: see Fig. 4: 33; D2: implicit to the disclosure;
- claim 4: D2: The analysis is done at the object (column 7, lines 58-60) and comprises the determination of time of flight (column 9, lines 46-47; column 10, lines 4-7);
- claim 7: D1: Fig. 4: 31, 33; column 11, lines 7-17; D2: Fig. 3: 60; column 12, lines 55-58; while keeping in mind column 7, lines 58-60 and column 8, lines 49-53);

5. The subject matter of **independent claim 8** and the additional features of dependent **claims 2, 4-6 and 9-18** are considered to lack inventive step with respect to D1 in combination with common general knowledge or in combination with the disclosure of D4, Art. 33 (3) PCT.

5.1 D1 discloses the following features of **independent claim 8**:

(a) A system for position determination of at least one identification tag (D1: abstract, lines 1-2), the system comprising:

(b) at least one stationary master unit (D1: Fig. 2: 1; column 8, lines 2-3), with an ultrasonic transducer (D1: Fig. 2: 2L, 2R) for transmitting ultrasonic signals in the form of ultrasonic pulses (D1: column 22, lines 58-61), receiving instructions from at least one central processing unit (D1: Fig. 3: 22).

(c) at least one identification tag (D1: Fig. 2: 10) according to claims 1-7 for transmitting the identification tag's identification as well as measured transit time

differences for received ultrasonic pulses together with any additional information (see paragraph 4.1 and 4.2; it is noted that "for" is to be read as "suitable for" as set out in the PCT-Gazette, Section IV-III-4.8. tag (10) of D1 is indeed suitable for transmitting time differences),

(d) a network interconnecting (the at least one) master unit with the central processing unit for transfer of instructions (see D1: Fig. 3: the data bus of the locator can be interpreted as being this network),

(e) means in the central processing unit for calling up identification tags (D1: column 22, lines 39-42) as well as detecting, collecting (D1: column 22, lines 44-46) and interpreting received radio signals from the identification tags (D1: see Table 1: the ID-tag returns its ID and a status code, which is then interpreted and used in the control unit), and

(f) processing means in the central processing unit for determining the position of the identification tags (D1: column 21, lines 35-36 and lines 44-47).

The system of D1 therefore differs from the system as claimed in claim 8 by separating the master unit and the central controller unit (which then implies the need to include in the master unit a receiver unit for receiving instructions from the controller). However, this is a normal design feature in location networks (see for example D3: figure 1). Hence, the system as claimed in claim 8 is considered to lack inventive step.

5.2 **Claim 2** Using frequency or code multiplexing is considered to represent a usual measure of design.

Claim 4 D1 discloses location determination using transit times (D1: column 5, lines 9-11). Carrying out the calculation directly at the ID-tag is considered to represent a usual measure of design.

Claim 5 If the calculation of the transit times is carried out at the ID-tag, the result has to be communicated to the interrogating locator. Since the communication is carried out via the RF-link (D1: column 7, lines 6-12), the

result of the calculations will be transmitted once the calculation is terminated.

Claim 6 Including an information about an attempt to remove and/or open the ID-tag in order to alarm the system is known from D4 (see abstract, last sentence).

5.3 The additional features of **claims 9-18** are considered to represent usual measures of design in the context of position determination systems, as follows:

Claims 9, 10:

A master/slave implementation is a usual measure of design (see e.g. D3: Fig. 1).

Claims 11, 13, 16:

Synchronisation of the master and the slave units is a usual measure of design (see e.g. D3: abstract, lines 5-7).

Claims 14, 15, 17 and 18:

Using a wired or wireless connection for communicating in the position determination system is a usual measure of design.

Claim 12:

Using coding or frequency diversity to distinguish the master and slave units is a usual measure of design.

6. The objections with respect to clarity notwithstanding, the subject matter of claim 19 appears to be novel, to involve an inventive step and to be industrially applicable (Article 33(1) to 33(4) PCT), since none of the documents cited in the search report discloses or points at such a method:

The method claimed in claim 19 comprises sending from a central processing unit commands to master units, which in turn synchronise with at least one slave unit in order to emit synchronised ultrasonic pulses. These ultrasonic pulses are in turn received by an ID-tag which comprises an ultrasonic receiver, a processing unit and an RF-transmitter. The processing unit calculates the transit time differences and transmit them together with the ID over the RF-link **directly to the central**

processing unit. In the central processing unit finally, the transit time differences, IDs and the positional information of the master and the slave US-transmitters are used to calculate the position of the ID-tag.

Claims 20 and 22-25 being dependent on claim 19 their subject matter appears as well to be novel, to involve an inventive step and to be industrially applicable.